

INVENTOR

James Woods

2115 La Mirada Drive
Vista, California, 92083

The inventor is a citizen of the United States of America

TITLE OF THE INVENTION

SELF PROPELLED BACKFILLING APPARATUS

ET 651042978US

FOR "SEE 650

1

SELF PROPELLED BACKFILLING APPARATUS

BACKGROUND OF THE INVENTION

This application claims the benefit of U.S. Application No. 09/498,712 filed on February 7, 2000.

1. Field of the Invention

6 The present invention relates to heavy equipment used in construction. More particularly, it relates to large earth moving machinery used in trenching and pipeline construction and the device, as herein disclosed, provides extremely accurate user control over the placement of soil and other material used to cover buried pipelines and to backfill structures during heavy construction.

2. Prior Art

Construction projects involving the removal and replacement of soil have been ongoing for thousands of years. Inevitably, construction projects large and small require the exacting removal and repayment of soil in trenches, behind walls, and over pipelines and cables. Placing sand, stone or gravel in a tight area can be one of the most time-consuming and costly tasks at a construction job site. Material may need placement to exacting specifications especially when covering pipelines and other underground utilities. Additionally, there may be concerns about disturbing the surrounding environment by using heavy machinery

09974338 10150
TOST BE 24660

1 to place aggregate materials, should those materials be misplaced
by the machine operator. Careful placement of many fill
materials is also a must in modern construction since many times
pipes, tanks or other under slab materials are damaged using
conventional backfilling.

6 Normally, the gravel, aggregate, soil, or other material to
be used for the fill stream arrives and is dumped on the ground
and is then loaded into a hopper of the machine which will
deposit the fill where it is needed. Depending on the size and
access available to the job site, this can take several men and
1 machines many hours to complete. Not only is this an outdated
process, but inefficient and costly to project owners and
contractors. On large projects such as pipelines, many tons of
fill material can be lost in the transferring process, as well as
the risk of accidental placement of material improperly or in a
16 fashion that actually damages the pipeline itself.

Consequently, there exists a need for an apparatus which
will provide for the easy transport and placement of fill
material constantly used in construction projects. Such a device
should provide for the easy transportation of the material itself
21 without excessive loss during transport. Additionally, such a
device should provide the user an easy manner to place the
material according to even the most exacting job specifications.

1 Further, such a device should also allow the user to accurately
place fill material while concurrently avoiding damage during the
burying of pipelines, cables, and other infrastructure that is
commonly buried. Finally, the device should maintain its own
center of gravity to prevent tipping.

6

SUMMARY OF THE INVENTION

Applicants' device is an easily mounted and operated
apparatus capable of use as a complete backfilling unit with
material reservoir or hopper for storage and transport of fill
material, a conveyor, and a fill material flow director. Or, in
some instances, components of the device may be manufactured for
mounting and use in combination with existing conveyer systems
used in the placement of fill material. The device in the
current best mode of a complete unit features a hopper for
holding fill material such as gravel, sand, soil, or similar
conventionally used materials. The hopper is mounted upon a
chassis or support structure of a vehicle that is moveable by
conventional wheel and axil or tread mounted systems of
propulsion. A telescopic conveyer system is also mounted upon
the chassis in a position to receive material from the hopper at
one end and convey that material to the distal end for placement
in trenches, behind wall, over pipelines, and in similar
conventional positions in which fill is required.

the channeling ramps in the form of a hydraulic ram. The hydraulic ram is controllable for elongation by the machine operator from the cab in the conventional fashion of such devices. The operator may elongate the ram to raise the attached channeling ramp to change the position of the distal end of the channeling ramp. By changing the position of one or both distal ends of both channeling ramps, the operator gains extremely precise control of the position in which the fill material is placed. Lowering both will provide a narrow but straight stream of material while raising both to the maximum will bifurcate the fill stream and place half of it on one side and the other half of the stream a distance from the first equal to the distance between the two distal ends of the pair of channeling ramps. Optionally, a swivel can be added to the strut allowing the operator to swivel the channeling ramp off the position parallel to the conveyor belt to allow for angled placement of fill.

Additional utility is provided by a means for altering the center of gravity of the hopper. This solves another vexing problem that exists with large machinery which in itself is heavy and becomes even heavier when carrying fill material. Such machines conventionally are prone to tip over when the machine encounters a grade. The means for altering the center of gravity of the hopper allows the user, or a computer, to adjust the

1 angle of the hopper from a normal position in relation to the
 frame of the machine to an ever increasing angle, depending on
 the grade encountered and upon the weight of the fill placed in
 the hopper. In this case, by using an axil mount at the base of
 the hopper and a hydraulic ram to tilt the hopper one direction
 6 or the other, an infinite number of different positions may be
 established for the hopper and a resulting number of adjustments
 of the center of gravity of the assembled machine to traverse the
 grade encountered.

An object of this invention is providing an easily used and
 1 maintained apparatus which provides for extremely accurate
 placement of fill material on construction sites.

It is a further object of this invention to provide an
 easily manufactured and operated fill material channeling ramp
 that may be attached to conventional conveyors when needed as an
 16 attachment.

An additional object of this invention is to provide a
 device allowing for use on steep grades by the adjustment of the
 center of gravity of the load carried by the device during use.

A further object of this invention is to minimize the waste
 21 and misplacement of fill material during backfill and burying of
 pipelines and underground utilities.

Another object of this invention is to reduce the risk of

1 damage to an infrastructure such as pipelines and other utilities
during the burial phase of their construction.

Further objects of the invention will be brought out in the
following part of the specification, wherein detailed description
is for the purpose of fully disclosing the invention without
6 placing limitations thereon.

BRIEF DESCRIPTION OF DRAWING FIGURES

Fig 1 is a side view of the device showing the fill material
hopper mounted on a powered vehicle with the flow director
1 attached at the distal end of a conveyor belt.

Fig 2 is a side view of the flow director attached at the
distal end of a conveyor belt depicting the two channeling ramps
adjusted for placement of fill material.

Fig 3 is a side view of the conveyor with the channeling
16 ramps in a retracted position for a narrow pour of the bifurcated
material stream.

Fig 4 depicts the independently adjustable channeling ramps
in unequal positions to bifurcate the fluid stream unevenly.

Fig 5 depicts a side view of the self powered vehicle on an
21 incline with the hopper adjusted to change the vehicle center of
gravity.

1 Fig 6 depicts and additional preferred embodiment of the
device with fixed or extendable conveyors which can be positioned
to deposit fill when a bifurcated material stream is not needed
and with a conveyor that can optionally be raised or lowered.

6 **DETAILED DESCRIPTION OF THE PREFERRED**
EMBODIMENTS OF THE INVENTION

Referring now to the drawing Figures 1-6 depict the various
components and interrelation thereof in operation of the
disclosed device **10**. Figure 1 depicts a side view of the device
10 as it would appear in operation as a complete unit. While it
is anticipated that components of the device **10** can be
manufactured as attachments to conventionally used back filling
devices, the current best mode of the device **10** works best as a
complete unit with a hopper **12** for holding and transporting fill
material, a conveyor means such as the depicted telescopic
conveyor **20**, and a material stream flow director **14**, functioning
in a symbiotic relationship to each other.

The device **10** in the current best mode of a complete unit
features a hopper **12** which is filled by the user with one or
combinations of conventional fill materials such as gravel, sand,
soil, or similar conventionally used materials. The hopper **12**

1 is mounted upon an attachment point depicted in this case as the
hopper axil **46** to the vehicle chassis **16** of a powered or self
propelled vehicle **18**. The self propelled vehicle **18** may be
powered by conventional means for vehicle power such as gasoline
or diesel engines which provide power via communicating hydraulic
6 pumps or by drive shafts communicating the power to wheels and
pump combinations or in other conventional means of powering a
wheeled or treaded or similar such piece of construction
equipment.

A conveyor means depicted by a telescopic conveyor **20** is
1 also mounted upon the chassis **16** by a support structure **26** which
defines the dimensions of the conveyor **20** built around it. The
conveyor means could also be a fixed length conveyor but in the
current best mode the conveyor means is a telescopic conveyor **20**
and provides the most utility. This is because it is adjustable
16 for positioning the distal end of the conveyor **20** and the flow of
fill material **22** leaving that end, at the location desired for
deposit of the material **22**. Since the receiving point for the
fill material **22** is generally in trenches, behind walls, over
pipelines, on top of power lines, gas pipes, and other
21 infrastructure utilities that are buried, adjustability in the
form of the telescopic conveyer **20** provides the user greater

TOP SECRET

1 adjustability for the flow of fill material **22** to the desired
location. With more effort, a fixed length conveyor could also
be used but the telescopic conveyor **20** is the current best mode.

6 The conveyor **20** works in the conventional manner of conveyor
belt systems and transports fill material **22** communicated from
the hopper **12** at the receiving end **23**, and conveys that material
22 on a rotating belt **21** to the distal end **24** for placement in
desired location. The belt would be powered by a conventional
means for powering the rotation of the belt such as a hydraulically
powered motor or electric motor. At the distal end **24** of the
11 conveyor **20** a means for adjustably bifurcating a communicated
stream of fill material is provided by the flow director **14**. The
flow director is attached to the distal end **24** of the conveyor
means in this case conveyor **20** in a position to constantly
receive substantially all of the fill material **22** communicated by
16 the conveyor **20** from receiving end **23** which receives fill from a
discharge aperture **11** operatively position in the hopper **12**. If
mounted to the conveyor **20** which is of fixed length, the flow
director **14** remains fixed in position relative to the ground
attached to the distal end **24** of the conveyor **20**. This would be
21 acceptable in instances when access to the target for the fill
stream is easily obtained and maintained. When mounted to the

1 distal end **24** of a conveyor **20** that is telescopic, when the
 conveyor **20** is telescoped and laterally translates, the location
 in relation to the ground of the fill material flow director **14**
 is easily positionable by the machine operator over the target
 position where fill material **22** is to be placed. The flow
 6 director **14** would be attached to the support structure **26** for the
 conveyor **20** just below a point at the distal end **24** where the
 conveyor **20** discharges the fill material **22** which has been
 communicated by the conveyor belt from the discharge aperture **11**
 in the wall of the hopper **12**.

1 The flow director **14** features a pair of channeling ramps **28**
 which are connected at a first end **29** of each of the ramps **28** by
 a ramp axil **30** in a position adjacent to the distal end **24** of the
 conveyor **20** at a strut **32** or other fixed member which is part of,
 or communicates with, the distal end **24** of the support structure
 16 **26** for the conveyor **20**. As depicted in the current best mode,
 the strut **32** provides a mount for the first end of each
 channeling ramp **28** but other means of attachment to the distal
 end of the conveyor **20** are anticipated.

21 The distal end **34** of each channeling ramp **28** opposite the
 first ends attached at the ramp axil **30**, are each independently
 positionable, to an infinite number of positions from their low

1 point determined by the minimum length of the hydraulic ram **36**,
which rotates them on the ramp axil **30** as depicted in figure 3,
and the high point of elevation of the distal ends **34** depicted in
figure 2, as determined by the maximum extension of the ram **36**,
which rotates them on the ramp axil **30**. The operator by
6 elongating the ram **36** using conventional controls, may change the
position of each of the two different distal ends **34**
independently to adjust the landing point for the material stream
discharged from that distal end **34**. Changing the positions of the
ramps **28** thus provides a means to direct each of two separated
material streams to a separate individual target position below
the distal end of said conveyor **20**. This allows the user to take
the bifurcated material stream and direct two separate streams of
material to a bury a target to be covered on the ground, such as
a pipe or trench, by a means for independent elevation of each of
16 the channeling ramps **28** in the form of a hydraulic ram **36**.
Electric solenoids or rack and pinion gear mechanisms might also
be used to provide the means for independent elevation of the
channeling ramps **28**, however, the current best mode uses
hydraulic rams **36** since the majority of heavy equipment of this
21 type are powered by on board hydraulic systems which also provide
power for the conveyor **20** and self propulsion using treads **50**

1 receiving power from a hydraulic motor. The hydraulic ram **36** is
controllable for elongation and contraction by the machine
operator from the cab of the powered vehicle **13** in the
conventional fashion of such devices which have a laterally
translatable arm moving in and out of a cylinder. The engine
6 providing propulsion by powering the hydraulic pumps or electric
motors would be operatively mounted to the chassis of the vehicle
13 in a position to allow operative communication with the
control levers in the cab **15** which allow the operator to control
the various functions powered by the engine. The operator may
11 elongate the ram **36** to raise the attached channeling ramp **28** and
thus change the position of the distal end **34** of the channeling
ramps **28**, or he can shorten the ram **36** to lower the ramps **28**.
Each ram **36** is independently adjustable to thereby swing the
attached channeling ramp **28** on the ramp axil **30**. The user can
16 thus independently adjust the position from the low point or the
center axis of trench or pipe or other item to be buried by
adjustment of one or both distal ends **34** of both channeling ramps
28 from centerline between the low point of adjustment. The
operator can thereby control the deposit position and quantity of
21 fill material deposited from each of the two parts of the
bifurcated stream of fill material **22** being split. This

09934-10101
TOP SECRET

1 individual adjustment of quantity of fill material so deposited
provides the operator extremely precise control of the position
and quantity at which the fill material **22** communicated to the
flow director **14** by the conveyor **20** is placed. Lowering both
channeling ramps **28** to the low point where the distal ends of
6 each channeling ramp are substantially adjacent to each other
will move the distal ends of the channeling ramps **28** over to the
center axis of the trench or pipe or other item being buried, and
provide a narrow but straight directional stream of fill material
22 to a single point. Conversely, raising both channeling ramps
1 **28** to the highpoint or maximum position essentially perpendicular
to the center axis of the pipe or trench, will move the distal
ends of the channeling ramps further away from the center line
and will bifurcate the communicated stream of fill material **22** to
a maximum distance from center line of the trench, pipe, or other
16 object being covered with fill.

Adjusting the angles of the ramps **28** also provide a means
adjustably bifurcating the volume of the two separate streams of
fill material and thereby allows the operator to place a defined
amount of fill material **22** in one location at the narrowest point
21 of separation of the distal ends, or defined amounts of the
communicated fill material **22** in two different target locations.

1 Since both of the channeling ramps **28** are independently
adjustable, there is an infinite number of positions for the
distal ends **34** of the channeling ramps **28** in relation to each
other and the center line of the object being buried by the fill
material thus allowing for an infinite number of adjustments of
6 the quantity, as well as the target location of each section the
streams of fill material being deposited. Further means of
adjustingly bifurcating the amounts of each of the two streams of
fill material being deposited is accomplished by using remote
controls for slowing, or speeding the rate of forward speed of
11 the belt **21** toward the distal end of the conveyor **20**. By
adjusting the motor that runs the conveyor and thus the speed of
the conveyor belt **21** the amount of fill material deposited on one
or the other of the channeling ramps **28** can also be adjusted.
This results because a faster speed of the belt **21** conveyor **20**
16 will produce more inertia on the fill material and naturally
cause more material to be deposited further away from the
conveyor distal end **24** causing more fill material **22** to deposit
on the outer channeling ramp **28**. Conversely slowing the speed of
the conveyor **20** will cause an equal distribution to each of the
21 pair of channeling ramps **28** with an even slower belt speed
causing more material to deposit on the closest of the ramps to

1 the distal end of the conveyor **20**, and less on the outer
channeling ramp **28**.

Since the flow of material can also be adjusted by
resistance provided by gravity in relation to the upward angle on
the channeling ramps **28**, the user can also adjust the flow and
6 volume of the two separate streams of material **22** by increasing
or decreasing the downward angle of the channeling ramps **28** in
relation to a position normal to the angle of the conveyor **20**. A
steeper angle will cause less back pressure on the stream of fill
material falling onto the ramps **28** causing a faster fall and more
1 material flowing down that ramp. A less steep angle will cause
the material to stay upon the channeling ramps **28** slightly longer
due to friction caused by gravity on the fill and thereby cause
back pressure in the flow of the material resulting in less
material reaching the designated position. By adjusting the
16 channeling ramps **28** to different individual angles, the operator
can precisely deposit more or less fill material to the desired
target from each of the channeling ramps **28** causing more fill
material to be deposited from one ramp **28** than the opposite ramp
28. Combinations of these different means for adjustingly
21 bifurcating the flow and thus the volume of deposited fill
material can be achieved by combining one or combinations of the

1 aforementioned speed control of the conveyor **20** and the angle of
the channeling ramps **27** and **28**.

 This ability to deposit fill material precisely on target
and in precise volume, is especially important in the backfill
operation involving pipelines and other trench buried

6 infrastructures. The aforementioned means for adjustably
bifurcating the stream of fill material, and the means to direct
each of the two separated material streams to an individual
target position below said distal end of said conveyor

allow increased precision as depicted in figures 2-5. As
1 depicted, each of the channeling ramps **27** and **28** have been
adjusted to a downward angle to yield the precise volume of
material **22** to be deposited in the precise target position on
below the distal end of the conveyor **20** on either side of the
centerline of the trench being filled, or, on adjacent sides of

16 an object such as a pipeline **42** or in a back fill of a wall **48** or
in other targeted positions for the separated fill streams. By
adjusting the position of the flow director **14** by laterally
translating the telescopic conveyor **20** and adjusting the angles
and elevation of the individual channeling ramps **28**

21 appropriately, the operator avoids damage to the pipe **42** which
could be caused by dropping fill material from the conveyor **20**

FOR REF. 1037-1038

- 1 directly onto the pipe 42 or onto the pipe 42 at the wrong angle
or from the wrong elevation. The ability to adjust each
channeling ramp 28 independently of the other as depicted in
figure 4, allows the operator to deposit an exact volume of
material 22 on each side of the pipe 42 to bury and protect it.
- 6 Individual adjustment of the channeling ramps 28 to equal or
differing distances from a center line allows more or less fill
material to be deposited by one or the other of the channeling
ramps 28 on either side of a target.

Additional means for steering the placement of fill material
is provided the operator by a control allowing the operator to
change the speed of the conveyor 20 or the angle of one or both
of the channeling ramps 28 and the position of the flow director
over the target to be buried, all at the same time. This allows
the operator a constant ability and means of steering the
16 placement of the fill material 22 as well as a means for
determining the volume of material 22 placed in one or a
plurality of positions of the two separate material streams.

The conveyor 20 if powered by conventional hydraulic systems
which as noted above can be sped up or slowed in the conventional
21 fashion using levers to change the flow rate of the hydraulic
fluid powering the motors 25. Or, if an electric motor is

1 instead used as a means to rotate the conveyor belt **21** on the
 conveyor **20** its speed can be increased or decreased in a
 conventional manner using electrical controls such as a
 potentiometer to control the speed of the electric motor which
 would communicate power to the belt **20** to rotate it.

6 Optionally, additional means for adjustment of the placement
 of the bifurcated material stream may be provided by a swivel **44**
 at the attachment point of the flow director **14** to the distal end
 of the conveyor **20**. Such an option would allow the operator to
 swivel the channeling ramps **28** to positions off the position
 parallel to the conveyor **20** to allow for angled placement of fill
22 discharged by the distal ends of the channeling ramps **28**. The
 swivel **44** can be hydraulically driven by a hydraulic motor **25** or
 gear driven, or electrically driven, in the aforementioned
 conventional manner of powering such construction equipment.

16 Additional utility is provided by an optional means for
 altering the center of gravity of the hopper **12**. This ability to
 adjust the massive weight imparted to the vehicle **12** by the load
 of fill material **22** deposited in the hopper **12** solves another
 vexing problem that exists with large machinery. Such machines,
 21 due to their mass and odd center of gravity caused by irregular
 shape and operational configurations, are prone to tip over when

1 the machine encounters a steep grade. The means for altering the
center of gravity of the hopper 12 allows the user, or a
computer, to adjust the angle of the hopper 12 from normal to the
vehicle 13 frame to a better angle, depending on the grade
encountered and upon the weight of the fill 22 placed in the
6 hopper 12.

As depicted in figure 5, a means for adjustment of the
vehicle center of gravity is provided by the hopper being
attached to the vehicle chassis at an attachment point having a
hopper axil 46 which rotationally attaches the hopper 12 to the
11 chassis 16 of the powered vehicle 13. The axil 46 is situated at
the base of the hopper 12 thus allowing the entire hopper 12 to
rotate on the axil 46 at the connection point to the vehicle 13.
A means to tilt the hopper 12 which in this case is a hydraulic
ram 36 of the same operation as mentioned above. However, other
16 devices such as rack and pinion gearing, or electric solenoids
could be used if desired or on vehicles so powered.

The operator, or a computer, tracking the incline traversed
by the vehicle 13 and the mass of the fill material 22 carried in
the hopper 12 can therein tilt the hopper 12 one direction or the
21 other by rotating the hopper 12 on the hopper axil 46 to an
infinite number of different positions between the position of

09978738-10190
T03T0T-8EE84650

1 the hopper on level ground normal to the vehicle chassis **16** and
the maximum radius or degree of rotation of the container on the
hopper axil **46**. By changing the angle of the hopper **12** from a
position normal to the chassis **16**, the operator changes the
center of gravity of the entire vehicle **18** since the force of the
6 mass of the hopper is imparted to the vehicle **18** at the
connection point where the chassis **16** provides the mount for the
hopper axil **46**. By altering the angle of the hopper **12**, the
operator is able to traverse road surfaces of much greater
incline than can be achieved without the means for altering the
1 vehicle's center of gravity. Such an ability allows the operator
to use the vehicle **18** without fear of roll over that would occur
in vehicles without this ability to change the center of gravity.

While the best mode of the device herein disclosed is as a
single unit with the hopper **12** having a means to adjust the
16 center of gravity of the attached vehicle **13** and combined with
the flow director **14** mounted to the end of the conveyor **20**, it is
possible that the flow director could be made attachable to
existing conveyors already in use and such a use is anticipated.
Attaching the flow director to existing conveyors which lack any
21 means to bifurcate or control the volume of material being
deposited would significantly enhance such devices.

1 Consequently the flow director **14** can be configured with a
means of attachment to a conventional conveyor already in use to
provide the utility described above and to thereby increase the
effectiveness, accuracy and speed of such conventional conveyors
in depositing fill material on designated targets. Such a use is
6 anticipated due to the huge increase in utility attaching the
flow director **14** by itself to retrofit existing conveyors and
conveyor systems on such vehicles currently in use.

FIG. 6
11 Figure 6 depicts and additional preferred embodiment of the
device which takes advantage of the extendable conveyors **20** which
as noted working in the conventional fashion of a conveyor belt
and convey fill material **22** communicated from the hopper **12** at
the receiving end **23** and transport the fill material **22** on a
rotating belt **21** to the distal end **24** of the conveyor **20**. The
belt **21** would be powered by a conventional means for powering the
16 rotation of the belt such as a hydraulically powered motor or
electric motor. The distal end **24** of the conveyor **20** in this
case would not have the flow director **14** and would deposit the
material **22** on top of or on the adjacent sides of the pipe **42** or
other structure in the trench to be buried. This embodiment,
21 while not yielding all of the benefits of the embodiment with the
flow director **14** does offer a substantial improvement over the

1 conventional manner of filling a trench which involves the use of
a mechanical shovel or backhoe which picks up buckets of dirt or
fill material **22** and simply drops it in the trench.

Another preferred embodiment of figure 6 while simpler in
nature, still provides a vast improvement over the current method
6 of backhoes and piles of dirt. In this embodiment, the conveyor
20 would have first and second conveyor belts **21** with the distal
end **24** being laterally translateable in relation to the receiving
end **23** which would receive material from the vehicle mounted and
adjustable hopper **12** thereby providing a means to telescope the
conveyor **20** to longer or shorter lengths to position the distal
end **24** over the area to be filled. Thus, the second conveyer
belt **21** would receive fill material **22** from the first conveyor
belt **21** deposited there from the hopper **12** on the receiving end
23. The second conveyor belt **21** of the conveyor **20** would render
16 the distal end **24** user positionable over the center or sides of
the trench by laterally translating the distal end **24** to the
appropriate position to deposit fill material **22** in the desired
location. This lateral translation of the second conveyor belt
21 under the first conveyor belt **21** would be accomplished using
21 hydraulic cylinders **36** or similar conventional means. Of course
the conveyor **20** might be comprised of a single conveyor belt **21**

1 which could laterally translate, the current best mode features a
 pair of conveyor belts **21** with the distal end **24** being on the
 conveyor belt **21** furthest from the hopper **12** and being laterally
 translateable. Optionally, the distal end **24** would also be
 adjustable for elevation using a means for adjustment of the
 6 elevation of the distal end **24** in the form of a conventional
 hydraulic cylinder **36** or similar controllable extension device to
 adjust the height of the distal end **24** above the trench by
 rotating the entire conveyor **20** at its connection below hopper **12**
 on the chassis **16**.

11 The conveyor **20**, using the vehicle mounted hopper **12** which
 itself is adjustable as noted above as a means to change the
 center of gravity of the vehicle for inclines, and the speed of
 the conveyor belts **21**, as well as the elevation of the distal end
24 and the laterally translated position of the distal end **24**,
 16 can all be combined and adjusted by the user to place the fill
 material **22** in the desired position in the trench. Thus, use of
 the telescoping or single piece conveyor **20**, and optional
 elevation adjustment thereof, attached to the tiltable vehicle
 mounted hopper **12**, provides a major increase in utility of trench
 21 filling over the aforementioned conventional manner of placing
 fill material **22** in a trench using a backhoe or similar shovel

1 device.

While all of the fundamental characteristics and features of the self propelled backfilling apparatus with controllable steering of fill material stream invention have been shown and described, it should be understood that various substitutions, 6 modifications, and variations may be made by those skilled in the art without departing from the spirit or scope of the invention. Consequently, all such modifications and variations are included within the scope of the invention as defined by the following claims.